AMENDMENTS TO THE CLAIMS:

The following listing of claims replaces all prior listings of claims in the present application:

Claims 1-2. (Canceled)

Claim 3. (Currently Amended) A distortion compensating apparatus having a memory for storing distortion compensation coefficients, which are for compensating for distortion of a transmission power amplifier, in association with power p of a transmit signal x(t), a predistortion unit for reading a distortion compensation coefficient $h_n(p)$ where n means a current value, which conforms to power p of the transmit signal x(t), out of said memory and subjecting the transmit signal x(t) to the distortion compensation processing using this distortion compensation coefficient $h_n(p)$, a digital-to-analog (DA) [[DA]] converter for converting a digital transmit signal, which has been subjected to the distortion compensation processing, to an analog signal, a distortion compensation coefficient calculation unit for calculating a distortion compensation coefficient h_{n+1} (p) based upon the transmit signal x(t) before the distortion compensation thereof and an output signal of the transmission power amplifier where n + 1 means a newly calculated value, and a distortion compensation coefficient $h_n(p)$ updating unit for updating the distortion compensation coefficient by storing the calculated distortion compensation coefficient h_{n+1} (p) in said memory in association with the power of the transmit signal x(t), said apparatus comprising:

a comparator for comparing power Pa of the transmit signal x(t) , ~~which is output from said predistortion unit by the distortion compensation processing that uses the distortion~~ compensated with the calculated distortion compensation coefficient h_{n+1} (p), and an upper-limit

power Pmax before the calculated distortion compensation coefficient $h_{n+1}(p)$ calculated by said distortion compensation coefficient calculation unit is stored in said memory; and

a distortion compensation coefficient correction unit for correcting the calculated distortion compensation coefficient $h_{n+1}(p)$ in such a manner that power Pa of the transmit signal x(t) will fall below the upper-limit power Pmax;

wherein said distortion compensation coefficient updating unit updates the distortion compensation coefficient $h_n(p)$ by storing a corrected distortion compensation coefficient $h_{n+1}(p)'$ in said memory when the power Pa of the transmit signal x(t) is greater than the upper-limit power Pmax and storing the calculated distortion compensation coefficient $h_{n+1}(p)$ in said memory when the power Pa is less than the upper-limit power Pmax.

Claim 4. (Previously Presented) The apparatus according to claim 3, further comprising a frequency multiplexer for multiplexing digital transmit signals upon digitally subjecting each digital transmit signal to a frequency shift decided by carrier frequency spacing, whereby a frequency-multiplexed signal is obtained;

wherein the frequency-multiplexed signal is input to said predistortion unit and said distortion compensation coefficient calculation unit as the transmit signal x(t).

Claim 5. (Currently amended) The apparatus according to claim 3, wherein if a ratio between the power Pa of the transmit signal x(t) that has been subjected to the distortion compensation processing and the upper-limit power Pmax is m^2 where m is a natural number, said distortion compensation coefficient correction unit outputs the corrected distortion compensation coefficient $h_{n+1}(p)'$ by correcting the calculated distortion compensation coefficient $h_{n+1}(p)$ to ~~$h_{n+1}(p)/m$~~ $h_{n+1}(p)$ divided by m .

Claim 6. (Currently Amended) The apparatus according to claim 5, wherein said distortion compensation coefficient updating unit updates the distortion compensation coefficient $h_n(p)$ by storing the calculated distortion compensation coefficient $h_{n+1}(p)$ in said memory if the power Pa of the transmit signal x(t) is less than the upper-limit power Pmax and storing the corrected distortion compensation coefficient $h_{n+1}(p)'$ in said memory if the power Pa of the transmit signal x(t) is greater than the upper-limit power Pmax.

Claim 7. (Currently Amended) The apparatus according to claim 3, wherein when said distortion compensation coefficient correction unit corrects the calculated distortion compensation coefficient $h_{n+1}(p)$ by subtracting the calculated distortion compensation coefficient $h_{n+1}(p)/n$ from the calculated distortion compensation coefficient $h_{n+1}(p)$, said distortion compensation coefficient correction unit obtains the smallest integer N that satisfies the following equation:

$$n \leq h_{n+1}(p) / \Delta h_{n+1}(p) \leq 2^N$$

and computes $h_{n+1}(p)/n$ by an N-bit shift operation of the calculated distortion compensation coefficient $h_{n+1}(p)$, where $\Delta h_{n+1}(p)$ is a value that satisfies the following equation:

$$h_{n+1}(p) = h_n(p) + \Delta h_{n+1}(p)$$

Claim 8. (Currently Amended) A distortion compensating apparatus having a memory for storing distortion compensation coefficients h(p), which are for compensating for distortion of a transmission power amplifier, in association with power of a transmit signal, a predistortion unit for subjecting the transmit signal to a distortion compensation processing using a distortion compensation coefficient that conforms to power p of the transmit signal, a digital-to-analog (DA) [[DA]] converter for converting a digital transmit signal, which has been subjected to the

distortion compensation processing, to an analog signal and inputting the analog signal to the transmission power amplifier; a distortion compensation coefficient calculation unit for calculating a distortion compensation coefficient $h_{n+1}(p)$ based upon the transmit signal before the distortion compensation processing thereof and a feedback signal fed back from an output side of the transmission power amplifier, and a distortion compensation coefficient updating unit for updating the distortion compensation coefficient $h_n(p)$, which has been stored in said memory, by the calculated distortion compensation coefficient $h_{n+1}(p)$ that has been calculated, said apparatus comprising:

a maximum distortion compensation coefficient output unit for outputting a value which is the square of a maximum distortion compensation coefficient $h(p)_{MAX}$ obtained based upon an upper-limit power Pmax and the transmit signal ~~x(t)~~;

a comparator for comparing the square $|h_{n+1}(p)_{n+1\text{-}n+1}|^2$ of the calculated distortion compensation coefficient $h_{n+1}(p)$, when the calculated distortion compensation coefficient $h_{n+1}(p)$ has been calculated in said distortion compensation coefficient calculation unit where n+1 means a newly calculated value, and the square $|h(p)max|^2$ of the maximum distortion compensation coefficient h(p)max; and

a distortion compensation coefficient correction unit for correcting ~~a~~ the calculated distortion compensation coefficient $h_{n+1}(p)$ in such a manner that the square of the calculated distortion compensation coefficient $h_{n+1}(p)$ will become smaller than the square of the maximum distortion compensation coefficient h(p)max;

wherein when the square of the calculated distortion compensation coefficient $h_{n+1}(p)$ is greater than the square of the maximum distortion compensation coefficient h(p)max, said calculated distortion compensation coefficient updating unit updates the distortion

compensation coefficient $h_n(p)$ that has been stored in said memory by the ~~corrected~~ calculated distortion compensation coefficient $h_{n+1}(p)$, and when the square of the calculated distortion compensation coefficient $h_{n+1}(p)$ is less than the square of the maximum distortion compensation coefficient h(p) max, said distortion compensation coefficient updating unit updates the distortion compensation coefficient $h_n(p)$ that has been stored in said memory by the calculated distortion compensation coefficient $h_{n+1}(p)$.

Claim 9. (Currently Amended) The distortion compensating apparatus according to claim 8, further comprising a frequency multiplexer for multiplexing digital transmit signals upon digitally subjecting each digital transmit signal to a frequency shift decided by carrier frequency spacing, whereby a frequency-multiplexed signal is obtained;

wherein the frequency-multiplexed signal is input to said predistortion unit and said distortion compensation coefficient calculation unit as the transmit signal ~~x(t)~~.

Claim 10. (Currently Amended) The distortion compensating apparatus according to claim 8, wherein said maximum distortion compensation coefficient output unit has a table for storing the squares of the maximum distortion compensation coefficients $h(p)_{MAX}$ in association with power of the transmit signal ~~x(t)~~, and the square of the maximum distortion compensation coefficient $h(p)_{MAX}$ is obtained from said table and is output.

Claim 11. (Currently Amended) The distortion compensating apparatus according to claim 8, wherein if a ratio between power Pa of the transmit signal compensated ~~output from the predistortion unit~~ by the distortion compensation processing using the corrected distortion compensation coefficient ~~$h_{n+1}(p)$~~ $h_{n+1}(p)'$ and the upper-limit power Pmax is m^2 where m is a natural number, said distortion compensation coefficient correction unit performs the correction

by correcting the calculated distortion compensation coefficient h_{n+1} (p) to the distortion compensation coefficient h_{n+1} (p)~~/m~~ divided by m.

Claim 12. (Currently Amended) The distortion compensating apparatus according to claim 8, wherein said distortion compensation coefficient updating unit updates the distortion compensation coefficient $h_n(p)$ by storing the calculated distortion compensation coefficient h_{n+1} (p) in said memory if the square $|h_{n+1}(p)|^2$ of ~~a~~ the calculated distortion compensation coefficient $h_{n+1}(p)$ is less than the square $|h(p)_{MAX}|^2$ of the maximum distortion compensation coefficient $h(p)_{MAX}$ and storing the corrected distortion compensation coefficient $h_{n+1}(p)'$ computed by the calculated distortion compensation coefficient ~~$h_{n+1}(p)/m$~~ $h_{n+1}(p)$ divided by m where m is a natural number in said memory if the square of the calculated distortion compensation coefficient $h_{n+1}(p)$ is greater than the square of the maximum distortion compensation coefficient $h(p)_{MAX}$.

Claim 13. (Currently Amended) The distortion compensating apparatus according to claim 8, wherein when said distortion compensation coefficient correction unit corrects ~~a~~ the calculated distortion compensation coefficient $h_{n+1}(p)$ by subtracting h_{n+1} (p) /n from the calculated distortion compensation coefficient h_{n+1} (p), said distortion compensation coefficient correction unit obtains the smallest integer N that satisfies the following equation:

$$n \leq h_{n+1}(p) / \Delta h_{n+1}(p) / \leq 2^N$$

and computes h_{n+1} (p) /n by an N–bit shift operation of the calculated distortion compensation coefficient h_{n+1} (p), where Δh_{n+1} (p) is a value that satisfies the following equation:

$$h_{n+1}(p) = h_n(p) + \Delta h_{n+1}(p)$$

Claims 14-20. (Canceled)

Claim 21. (Currently Amended) A distortion compensating apparatus having a memory for storing distortion compensation coefficients h(p), which are for compensating for distortion of a transmission power amplifier, in association with power p of a transmit signal, an error signal generator for reading a distortion compensation coefficient h(p) that conforms to power of ~~a~~ the transmit signal out of said memory, subjecting the transmit signal to a distortion compensation processing using this distortion compensation coefficient h(p) and outputting an error signal, which is the difference between the transmit signal obtained by being subjected to the distortion compensation processing and the transmit signal before the distortion compensation processing thereof, a digital-to-analog (DA) [[DA]] converter for converting the error signal to an analog error signal and outputting the analog error signal, a combiner for adding the output of said DA converter to an analog transmit signal and inputting the resultant signal to the transmission power amplifier, a distortion compensation coefficient calculation unit for calculating a ~~the~~ distortion compensation coefficient $h_{n+1}(p)$ based upon the transmit signal before the distortion compensation processing thereof and an output signal of the transmission power amplifier, and a distortion compensation coefficient updating unit for updating the distortion compensation coefficient h(p) by storing the calculated distortion compensation coefficient $h_{n+1}(p)$ in said memory in association with power of the transmit signal, said distortion compensating apparatus comprising:

a comparator for comparing the square $|h_{n+1}(p)|^2$ of ~~a~~ the calculated distortion compensation coefficient $h_{n+1}(p)$ and the square $|h(p)_{MAX}|^2$ of a set maximum distortion compensation coefficient $h(p)_{MAX}$ before the calculated distortion compensation coefficient h_{n+1}

(p) where $_{n+1}$ means a new value, which has been calculated by said distortion compensation coefficient calculation unit, is stored in said memory; and

a distortion compensation coefficient correction unit for correcting the calculated distortion compensation coefficient h_{n+1} (p) when the square $|h_{n+1}(p)|^2$ of the calculated distortion compensation coefficient h_{n+1} (p) is greater than the square $|h(p)_{MAX}|^2$ of the set maximum distortion compensation coefficient $h(p)_{MAX}$;

wherein said distortion compensation coefficient updating unit updates the distortion compensation coefficient h(p) by storing the calculated distortion compensation coefficient $h_{n+1}(p)$ in said memory if the square $|h_{n+1}(p)|^2$ of the calculated distortion compensation coefficient $h_{n+1}(p)$ is less than the square $|h(p)_{MAX}|^2$ of the set maximum distortion compensation coefficient $h(p)_{MAX}$ and storing the corrected distortion compensation coefficient $h_{n+1}(p)'$ in said memory if the square $|h_{n+1}(p)|^2$ of the calculated distortion compensation coefficient h_{n+1} (p) is greater than the square $|h(p)_{MAX}|^2$ of the set maximum distortion compensation coefficient $h(p)_{MAX}$.

Claim 22. (Currently Amended) The distortion compensating apparatus according to claim 21, wherein if a ratio between the square $|h_{n+1}(p)|^2$ of the calculated distortion compensation coefficient $h_{n+1}(p)$ and the square $|h(p)_{MAX}|^2$ of the set maximum distortion compensation coefficient $h(p)_{MAX}$, is m^2 where m is a natural number, said distortion compensation coefficient correction unit outputs a corrected distortion compensation coefficient $h_{n+1}(p)'$ ~~$+h_{n+1}(p)'+$~~ by correcting the calculated distortion compensation coefficient $h_{n+1}(p)$ to the distortion compensation coefficient $h_{n+1}(p)$[[/m]] divided by m.

Claim 23. (Currently Amended) The distortion compensating apparatus according to claim 21, further comprising:

a first frequency multiplexer for multiplexing digital transmit signals upon digitally changing each digital transmit signal to a frequency shift signal decided by carrier frequency spacing, whereby a frequency-multiplexed signal is obtained;

means for inputting the frequency-multiplexed signal to said error signal generator and distortion compensation coefficient calculation unit as the transmit signal ~~x(t)~~;

a further DA converter for converting the digital transmit signals to analog transmit baseband signals and

a second frequency multiplexer for multiplexing the analog transmit baseband signals upon each analog transmit baseband signal to a frequency shift signal decided by carrier frequency spacing, whereby a second frequency-multiplexed signal is obtained and inputting the second frequency-multiplexed signal to said combiner as an analog transmit signal ~~x(t)~~.

Claim 24. (Currently Amended) The distortion compensating apparatus according to claim 21, further comprising:

frequency shifting means for digitally changing digital transmit signals to frequency shift signals decided by carrier frequency spacing, whereby the frequency-shifted signals are obtained;

a first frequency multiplexer for multiplexing the frequency-shifted signals;

means for inputting the ~~frequency~~ multiplexed frequency-shifted signal to said error signal generator and said distortion compensation coefficient calculation unit as the transmit signal ~~x()~~;

a further DA converter for converting the frequency-shifted signals to analog signals;

a second frequency multiplexing unit for combining the analog signals, whereby an analog frequency-multiplexed signal is obtained; and

means for inputting the analog frequency-multiplexed signal, which is output from said second frequency multiplexer, to said combiner as an analog transmit signal ~~x(t)~~.

Claims 25-31. (Canceled)

Claim 32. (Previously Presented) A distortion compensating apparatus for compensating for distortion of a transmission power amplifier, comprising:

a memory for storing distortion compensation coefficients, which are for compensating for distortion of the transmission power amplifier, in association with power of a transmit signal;

a predistortion unit for subjecting the transmit signal to a distortion compensation processing using a distortion compensation coefficient that conforms to power of the transmit signal, and inputting the resultant signal to the transmission power amplifier;

a distortion compensation coefficient calculation unit for calculating the distortion compensation coefficient based upon a difference between the transmit signal before the distortion compensation processing thereof and a feedback signal fed back from an output side of the transmission power amplifier, and updating the distortion compensation coefficient, which has been stored in said memory, by the distortion compensation coefficient that has been calculated;

a limit-surpass detector for detecting whether the transmit signal that has been subjected to the distortion compensation processing has surpassed a limit level; and

an amplitude controller for controlling the amplitude of the feedback signal when the limit level has been surpassed.

Claim 33. (Previously Presented) The distortion compensating apparatus according to claim 32, wherein said amplitude controller controls the amplitude of the feedback signal based upon the amplitude or power of the transmit signal before the distortion compensation processing thereof.

Claim 34. (Currently Amended) The distortion compensating apparatus according to claim 32, further comprising means for comparing the power of the transmit signal that has been subjected to the distortion compensation processing and a power, which is obtained by multiplying the power of the transmit signal before the distortion compensation processing thereof by k, and instructing said amplitude controller to start control of the amplitude of the feedback signal if the ~~former~~ power of the distorted transmit signal is greater than the ~~latter~~ obtained power when the limit level has been surpassed;

wherein said amplitude controller responds to the instructing to start amplitude control by controlling the amplitude of the feedback signal.

Claim 35. (Currently Amended) The distortion compensating apparatus according to claim 32, further comprising means for comparing a power, which is obtained by multiplying the power of the transmit signal before the distortion compensation processing thereof by k, and the power of the transmit signal that has been subjected to distortion compensation processing, instructing said amplitude controller to start control of the amplitude of the feedback signal if the ~~latter~~ power of the distorted transmit signal is greater than the ~~former~~ power of the transmit signal when the limit

level has been surpassed, and instructing said distortion compensation coefficient calculation unit to halt the updating of the distortion compensation coefficient if the difference between the two powers ~~former and the latter~~ has exceeded a threshold value;

wherein said amplitude controller responds to the instructing to start ~~amplitude control by~~ controlling the amplitude of the feedback signal, and said distortion compensation coefficient calculation unit responds to the instructing to halt the updating of the distortion compensation coefficient by halting calculation of the distortion compensation coefficient

Claim 36. (Currently Amended) The distortion compensating apparatus according to claim 32, further comprising means for comparing the power of the transmit signal that has been subjected to the distortion compensation processing and a power which is obtained by multiplying the power of the transmit signal before the distortion compensation processing thereof by k, instructing said amplitude controller to start control of the amplitude of the feedback signal if the ~~former~~ power of the distorted transmit signal is greater than the ~~latter~~ obtained power when the limit level has been surpassed, and inputting the difference between the ~~former and the latter~~ two powers to said distortion compensation coefficient calculation unit;

wherein said amplitude controller responds to the instructing to start ~~amplitude control by~~ controlling the amplitude of the feedback signal, and said distortion compensation coefficient calculation unit changes a parameter value, which is used in the calculation of the distortion compensation coefficient, based upon said difference.

Claim 37. (Currently Amended) The distortion compensating apparatus according to claim 32, further comprising a digital-to-analog (DA) [[DA]] converter for converting a digital transmit

signal that has been subjected to the distortion compensation processing to an analog signal and inputting the analog signal to the transmission power amplifier;

wherein said predistortion unit multiplies the digital transmit signal before the distortion compensation processing by a digital distortion compensation coefficient to thereby subject the transmit signal to the distortion compensation processing, and said DA converter converts an output from said predistortion unit to an analog signal and outputs this analog signal.

Claims 38-42. (Canceled)